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2006 NORTH IDAHO DOUGLAS-FIR TUSSOCK MOTH TRAPPING SYSTEM REPORT

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INTRODUCTION

The Douglas-fir tussock moth (DFTM) Early Warning System (EWS) in north Idaho is a cooperative effort between the USDA Forest Service (FS) and Idaho Department of Lands (IDL). This system uses a series of permanent pheromone trapping sites to identify increasing populations of DFTM prior to an outbreak and tree defoliation (Daterman et al. 1979). IDL maintains DFTM trap sites from Coeur d'Alene to Moscow; the Northern Region of the FS maintains trap sites from Lewiston east and south to the Salmon River.

A pheromone trap site consists of five sticky traps baited with the DFTM attractant pheromone. Male moths are attracted to and caught in the traps. An average of 25 male moths per site is used as a threshold to alert managers to rising DFTM populations. Additional population measurements, such as larval or egg mass sampling, is then conducted in areas of concern surrounding the trap site to determine the status of the population (Daterman et al. 1979).

METHODS

2006 Trapping Results

Of 51 sites trapped by IDL, the average trap catch was 0.33 moths per trap, up from 0.004 moths per trap in 2005 and 0.02 moths per trap in 2004 (Appendix 1). There were no sites with an average of 25 moths per trap in 2006. The sites with the highest number of moths caught in 2006 were near East Fork Flat Creek, with an average of 2.6 moths per trap.

Twenty six moths were caught on the 26 Forest Service-monitored sites south of Lewiston (Appendix 2), for a total average of 0.2 moths. Sites with the highest catch numbers were Bald Mountain (plot ID 17.0) and Grangemont (plot ID 23.0), with nine moths and seven moths, respectively. Eleven moths were caught on the 6 sites near Potlatch for a total average of 0.4 moths (Appendix 2). Six were trapped at Little Boulder Creek (plot ID 35.0), four at West Fork Potlatch Road (plot ID 36.0), and one at Elk

Creek Falls (plot ID 37.0).

Defoliation

There was no aerially detected DFTM-caused defoliation in north Idaho in 2006. The most recent outbreak in North Idaho (2000-2002) caused significant defoliation on the Clearwater National Forest, and on adjacent state and private lands

between Moscow and Plummer (fig. 1). DFTM outbreaks have occurred in this same general area about every 10 years since the 1940's (Randall 2002, Tunnock 1973). An outbreak prior to the most recent one occurred with defoliation during only 1 year—1986. Both outbreaks were preceded by increasing numbers of moths caught in traps (fig. 1).

Douglas-fir Tussock Moth Trap Catches and Defoliation North Idaho (IDL)

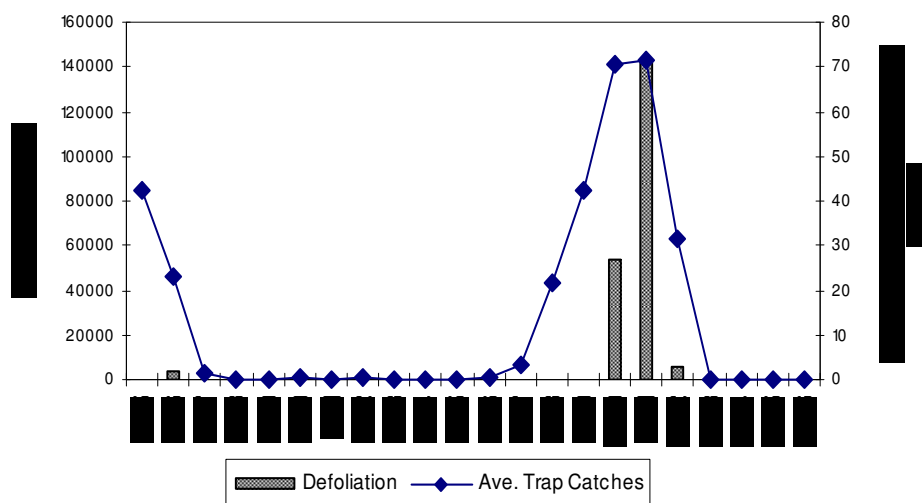


Figure 1. Average trap catches by IDL north of Moscow and aerially detected defoliation for the last two DFTM outbreaks (adapted from Kegley et al., 2004).

CONCLUSIONS

The DFTM, EWS is effective in predicting outbreaks, but its design and intent does not define where defoliation events will occur (Sheehan and Ragenovich 2002). Land managers, with consultation from local entomologists, will need to identify and prioritize areas where management objectives are most vulnerable to significant defoliation impacts. In areas where an insecticide application may be considered to mitigate impacts, cocoon and/or larval sampling should be conducted to estimate current DFTM populations (Brooks et al. 1978).

In north Idaho, the EWS proved effective in predicting the two latest DFTM outbreaks, which were preceded

by 3 years of increasing trap catches. However, intensity of the outbreaks could not be predicted by trapping alone. Trap catches preceding defoliation in 1986 were about the same as those preceding defoliation in 2000. But intensity of the two outbreaks was very different (Kegley et al. 2004). This confirms the need for additional population sampling (egg mass or larval sampling) to help predict trends of outbreaks (Mason and Torgersen 1983).

Trapping for Douglas-fir tussock moth will continue annually but we expect trap catches to remain very low for the next several years.

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Appendix 1. Average trap catch for IDL monitored sites from Coeur d'Alene to Moscow for the past 7 years.

#	AREA	2006	2005	2004	2003	2002	2001	2000
1	Elk Mountain	*	*	0.0	*	*	*	13.8
2	Coeur d'Alene Mountain	*	*	0.0	*	*	*	8.4
3	Lolo Pass	0.0	0.0	0.0	0.0	8.2	110.2	91.8
4	Charles Butte	0.0	0.0	0.0	0.2	28.2	84.8	73.6
5	Peterson Point	*	0.0	0.0	0.2	15.8	101.0	56.4
6	East Dennis	0.0	0.0	0.0	1.2	75	101.2	81.2
7	East Gold Hill	0.0	0.0	0.0	0.2	14.8	53.8	83.6
8	Flat Creek	0.4	0.0	0.2	0.0	7.6	88.0	87.6
9	Long Creek	0.2	0.0	0.0	0.2	33.6	0.2	105.4
10	Paradise Point	0.2	0.0	0.0	0.0	17	91.8	81.2
11	Mineral Mountain	0.0	0.0	0.0	1.8	75.2	56.4	73.4
12	Mission Mountain	1.2	0.0	0.0	0.2	25.6	1.6	65.6
13	Spring Valley Creek	*	0.0	0.0	0.0	5.4	58.0	61.2
14	Vassar Meadows	0.0	0.0	0.0	0.0	95.8	102.8	83.2
15	Fairview Knob	0.0	0.0	0.0	0.2	39	105.8	33.2
21	West Twin (10-115)	*	0.0	0.0	0.0	8.8	75.4	*
22	Moscow Mtn (115-114)	0.0	0.0	0.0	0.2	5.8	78.0	90.8
101	S Fk Little Plummer Ck	1.4	0.0	0.0	2.8	52.2	92.4	70.0
102	Windfall Pass	0.6	0.0	0.0	0.6	40.4	99.6	74.2
103	Squaw Creek	*	0.0	0.0	0.2	9.4	89.2	55.2
104	Moses Mountain	0.0	0.0	0.0	0.2	6.4	67.8	19.0
105	Little John Creek	0.0	0.0	0.0	1.4	45	78.4	54.8
106	Emida Peak	0.0	0.0	0.2	2.6	64.2	75.8	71.0
107	North-South Ski Area	0.0	0.0	0.0	0.6	83.2	107.2	73.6
108	Bald Mountain	*	0.0	0.0	0.0	25.2	53.8	5.2
109	Laird Park	0.0	0.0	0.0	1.0	66	86.0	74.8
110	North Fork Palouse River	0.0	0.0	0.0	1.0	83.2	75.2	24.8
111	Mica Mountain	0.0	0.0	0.0	0.2	67.6	93.6	81.0
112	Schwartz Creek	0.0	0.0	0.0	0.2	80.6	110.6	89.0
113	Big Bear Creek	0.6	0.0	0.0	0.2	47.8	87.0	71.4
114	Big Meadow Creek	0.2	0.0	0.0	0.0	11.2	70.2	108.6
115	East Twin Mountain	0.2	0.0	0.0	0.0	7.6	85.4	87.4
116	Crane Point	*	0.0	0.0	0.0	51	89.0	63.2
117	Sheep Creek	0.2	0.0	0.0	0.0	27.8	83.2	79.2
118	West Fork Mission Creek	*	0.0	0.0	0.0	22.2	47.6	37.0
119	1 Mi N. of Mineral Mtn (11-216)	*	0.0	0.0	0.0	25.2	0.2	82.8
200	2 mi W of Plummer	*	0.0	0.0	0.0	16.2	80.2	25.0
201	Coon Creek	2.0	0.0	0.4	0.2	21.6	93.8	50.8
202	3 mi E of Benewah	0.2	0.0	0.0	0.6	21	102.2	*
203	Benewah Point	*	0.0	0.0	0.0	8.2	92.4	53.0
204	John's Point	*	0.0	0.0	0.0	23.8	*	*
205	3 mi E of Charles Butte	0.0	0.2	0.2	0.4	63.6	72.6	64.8
206	Sunset Mountain	*	0.0	0.0	0.0	20.8	*	*

207	Emerald Butte	*	0.0	0.0	0.0	23.2	*	*
208	Cedar Butte	*	0.0	0.0	0.0	22.4	76.2	*
209	Abes Knob	*	0.0	0.0	0.0	23.8	88.4	*
Plot #	AREA	2006	2005	2004	2003	2002	2001	2000
210	West Fork Deep Creek	0.2	0.0	0.0	0.2	77	90.6	91.2
211	Cherry Butte	0.0	0.0	0.2	0.4	67.2	88.6	50.6
212	Jackson Mountain	*	0.0	0.0	0.0	19.6	*	*
213	Red Horse Mountain	*	*	0.0	*	*	*	3.2
214	Fortier Creek	*	*	0.0	*	*	*	2.4
215	Killarney Mountain	*	*	0.0	*	*	*	4.4
216	1 mi NW of Mineral Mtn	0.4	0.0	0.0	0.2	1	0.2	93.0
217	Head of Sheep Creek (216-117-2)	0.2	0.0	0.0	0.6	21.2	97.2	101.8
300	Mission Mountain (#2)	0.4	0.0	0.0	0.6	6.4	67.0	71.2
301	1.5 mi S of Mineral Mtn	0.2	0.0	0.2	0.2	69.4	91.2	107.6
302	Middle Fork of Deep Creek 1 (301-216-1)	*	0.0	0.0	0.0	63.8	3.6	89.8
303	Middle Fork of Deep Creek 2 (301-216-3)	0.4	0.0	0.2	1.0	58	15.8	99.6
400	3 mi S of Mineral Mtn	0.2	0.0	0.0	0.6	75.8	86.6	108.6
401	Flynn Butte	0.0	0.0	0.0	3.2	95.2	96.4	67.8
402	2 mi SE of Browns Mdw	0.2	0.0	0.0	0.0	15.2	57.4	112.0
500	3 mi SW of Harvard	0.2	0.0	0.0	0.0	18.8	74.6	111.0
501	2 mi S of Moon Hill	*	0.0	0.0	0.0	16.2	97.6	70.0
502	3 mi W of Crane Point	*	0.0	0.0	0.6	67.6	75.0	
503	3 mi N of Stanford Point	*	0.0	0.0	0	10.2	89.4	84.0
504	2 mi N of Stanford Point	0.4	0.0	0.0	0.2	47.8	86.2	75.8
505	1 mi SW of Stanford Point	*	0.0	0.0	0.0	38.4	47.0	88.0
506	1 mi S of Stanford Point	*	0.0	0.0	0.0	23.4	67.8	70.6
507	1 mi NE of Stanford Point	0.0	0.0	0.0	0.8	40.6	87.4	97.4
508	1 mi W of Stanford Point	0.2	0.0	0.0	0.0	20.6	92.4	95.2
509	2 mi NW of Stanford Point	0.6	0.2	0.4	0.4	43.2	81.6	95.6
510	Moon Hill	0.2	0.0	0.0	0.8	35	67.2	66.2
511	2 mi SE of Moon Hill	*	0.0	0.0	0.2	13.2	80.4	72.6
512	3 mi S of Mineral Mtn	*	0.0	0.0	0.2	70.2	*	*
513	2 mi SW of Moon Hill	*	0.0	0.0	0.0	9.6	9.2	75.8
514	1.5 mi NW of Avon	*	0.0	0.0	0.0	6.8	61.4	68.6
601	1 mi NW of Elk Mtn	*	*	0.0	*	*	*	8.4
602	Pleasant Creek	*	*	0.0	*	*	*	0.4
603	West Fork Fortier Creek	*	*	0.0	*	*	*	3.2
604	Elk Mountain	*	*	0.0	*	*	*	15.4
605	Rose Creek	*	*	0.0	*	*	*	8.2
701	Fourmile Creek	*	0.0	0.0	0.0	9	88.6	46.4
702	North of Granite Point	*	0.0	0.0	0.0	5.8	76.0	81.6
703	Spring Valley Creek	*	0.0	0.0	0.0	12.2	96.6	92.4
704	West Fork Big Bear Creek	0.2	0.0	0.0	0.2	13.2	61.0	41.4
705	2 Mi NW of Stanford PT	0.8	0.0	0.0	0.4	46.4	89.4	84.6
706	1 Mi S. of Iron Mtn	*	0.0	0.0	0.0	27.2	87.8	22.2
707	Iron Mtn	*	0.0	0.0	0.0	6.6	97.0	23.0
708	Little Bear Creek	*	0.0	0.0	0.0	65.6	108.6	*
709	Quartz Creek	*	0.0	0.0	0.0	50.4	96.2	*

710	Turnbow Creek	1.4	0.0	0.0	0.2	43	70.6	*
711	East Fork Flat Creek	2.6	0.0	0.0	0.2	55	71.4	85.8
712	Turnbow Point	*	0.0	0.0	0.2	7.8	38.0	79.4
713	3 Mi S. of Potlatch	*	0.0	0.0	0.0	6.6	30.0	4.2
714	Rocky Point	*	0.0	0.0	0.0	13.2	79.6	40.2
Plot #	AREA	2006	2005	2004	2003	2002	2001	2000
715	Hatter Creek	0.6	0.0	0.0	0.2	7.4	32.0	22.4
716	Head of Big Meadow Creek	*	0.0	0.0	0.0	11.8	80.8	82.4
717	Nora Creek	*	0.0	0.0	0.0	21.2	81.4	58.4
718	Crummaring Creek	*	0.0	0.0	0.0	12.4	70.4	68.8
719	Basalt Hill	*	0.0	0.0	0.0	19	11.6	92.8
720	Browns Meadow	0.0	0.0	0.2	0.2	11.2	2.6	97.6
721	Smith Creek	*	0.0	0.0	0.0	100.2	70.6	*
722	Prospect Peak	*	0.0	0.0	0.0	31.2	56.8	85.6
723	West Fork Mission Creek	*	0.0	0.0	0.0	27.8	22.2	87.4
724	Huckleberry Mtn	*	0.0	0.0	0.0	16.6	77.2	43.4
725	North Fork Pine Creek	*	0.0	0.0	0.0	21.6	93.0	15.0
726	Mineral Creek	*	0.0	0.0	0.0	20.2	78.0	76.2
727	South of Sanders	*	0.0	0.0	0.0	77.8	86.8	32.4
800	Mason Butte	*	*	0.0	0.0	20.8	63.0	*
801	Mocileme Butte	*	*	0.0	0.0	30.2	91.4	*
802	Plummer Butte	*	*	0.0	0.0	24.8	75.2	*
803	Little Plummer Creek	*	*	0.0	0.0	18	54.4	*
804	Lindstrom Peak	*	*	0.0	0.0	21.2	66.4	*
805	John Point	*	*	0.0	0.0	20.4	61.6	*
806	Pettis Point	*	*	0.0	0.0	22.6	71.2	*
807	Beaver Mtn	*	*	0.0	0.0	17.8	55.6	*
808	Renfro Peak	*	*	0.0	0.0	14.8	44.2	*
809	Crystal Peak	*	*	0.0	0.0	10.4	29.4	*
810	Head of Child Creek	*	*	0.0	0.0	17.2	52.8	*
811	Hobo Pass	*	*	0.0	0.0	7.8	25.4	*
812	Hemlock Butte	*	*	0.0	0.0	9.2	28.2	*
813	Carpenter Peak	*	*	0.0	0.0	18.8	57.8	*
814	Tyson Creek	*	*	0.0	0.0	30.2	87.6	*
815	Willow Peak	*	*	0.0	0.0	25.2	85.2	*
816	Sunset Mtn	*	*	0.0	0.0	31	86.2	*
817	Willow Creek	*	*	0.0	0.0	22.2	73.2	*
818	Head of Emerald Creek	*	*	0.0	0.0	28.2	86.0	*
819	Emerald Butte	*	*	0.0	0.0	25	75.2	*
820	Head of Bobs Creek	*	*	0.0	0.0	25.4	79.0	*
821	East Fork of Potlatch River	*	*	0.0	0.0	25.2	67.2	*
822	Head of Moose Creek	*	*	0.0	0.0	24.8	69.6	*
823	Beals Butte	*	*	0.0	0.0	39	106.2	*
	* not trapped							
	Total Average	0.3	0.0	0.02	0.2	31.3	71.5	70.4

Appendix 2. Average trap catch for FS monitored sites south of Lewiston for the past 11 years, and 6 sites trapped in 2002-2006 near Potlatch.

Plot ID	Site Name	Site #	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996
1.0	Keuterville	3-1	0.0	0.0	0.0	0.0	0.0	2.2	0.0	1.6	0.6	0.0	0.0
2.0	Johnson	5-1	0.0	0.0	0.0	0.0	4.8	4.0	0.2	3.0	1.2	0.0	0.0
3.0	Summit Landing	5-6	0.6	0.0	0.0	0.2	0.0	14.6	0.4	0.8	0.2	0.0	0.0
4.0	Cottonwood Butte	3-2	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.4	0.0	0.0	0.0
5.0	Shin Pt	5-7	0.0	0.0	0.0	0.0	1.3	13.2	0.2	3.6	5.6	0.0	0.0
6.0	Cooper	5-10	0.0	0.0	0.0	0.0	0.2	3.8	2.2	1.4	0.8	0.0	0.0
7.0	Lake Waha	4-1	0.0	0.0	0.2	0.0	0.0	10.2	0.0	0.8	1.4	0.0	0.0
8.0	Skull Cr	5-9	*	*	0.0	*	*	*	5.2	2.2	2.0	0.0	0.0
9.0	Canyon Junction	6-1	0.0	0.0	0.0	0.0	0.8	11.2	*	0.0	*	0.0	0.0
10.0	Forest	4-6	*	0.0	0.0	*	*	*	0.0	0.6	0.0	0.0	0.0
11.0	Swanson Cr	5-8	0.6	0.0	0.0	1.4	0.0	17.5	0.0	1.4	0.8	0.0	0.0
12.0	Fan saddle	6-2	0.0	0.0	0.0	0.0	0.2	0.6	1.0	0.4	0.4	0.0	0.2
13.0	Webb Cr	4-5	0.0	*	0.0	0.0	0.0	1.4	0.0	0.2	0.0	0.0	0.0
14.0	Angel Butte	5-2	0.0	0.0	0.0	0.4	0.8	5.8	0.2	2.2	2.2	0.0	0.0
15.0	Lodge Pt	1-1	0.0	0.0	0.0	0.2	1.2	1.6	0.4	4.6	3.2	0.0	0.0
16.0	Black Pine	4-2	0.0	0.0	0.0	*	0.2	18.2	0.0	0.4	0.0	0.0	0.0
17.0	Bald Mtn	5-5	1.8	0.0	0.0	0.2	9.0	36.0	0.0	3.2	0.4	0.0	0.0
18.0	Big Tinker	1-5	0.2	0.0	0.0	0.0	0.6	1.4	1.6	2.5	0.2	0.0	0.0
19.0	Junction	4-3	0.0	0.0	0.0	0.0	0.0	*	0.0	0.2	0.8	0.0	0.0
20.0	Bargamin Cr	5-4	0.0	0.0	0.0	0.0	4.8	35.6	0.0	0.0	0.0	0.0	0.0
21.0	Potatoe Hill	1-4	0.0	0.0	0.0	0.0	0.2	0.2	3.0	1.8	1.4	0.0	0.0
22.0	Captain John	4-4	0.0	0.0	0.0	0.0	0.2	3.6	0.0	*	0.8	0.0	0.0
23.0	Grangemont	5-3	1.4	0.0	0.0	0.4	2.2	16.2	0.0	1.2	0.6	0.0	0.0
24.0	Pine Knob	1-3	0.2	0.0	0.0	0.0	1.0	4.8	0.0	2.8	3.4	0.0	0.0
25.0	Christie Cr	2-2	0.0	0.0	0.0	0.0	0.0	8.0	0.0	0.0	0.0	0.0	0.0
26.0	S. Cow Cr	2-5	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0
27.0	Cow Cr Saddle	2-3	*	0.0	0.0	0.0	0.2	0.2	0.0	*	0.2	0.0	0.0
28.0	Rhett Cr	2-1	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
29.0	Low Saddle	2-4	0.4	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.4	0.0	0.0
30.0	Goddard	1-2	*	*	0.0	*	*	*	0.0	0.4	0.2	0.0	0.0
31.0	Wickiup B		*	*	*	*	*	*	0.0	0.0	0.2	0.0	0.0
32.0	Craigmont		*	*	*	*	*	*	0.0	1.8	1.8	0.0	0.0
	Total Average of sites south of Lewiston		0.2	0.0	0.03	1.0	8.3	0.5	1.3	0.9	0.0	0.01	0.0
33.0	Laird Park	7-1	0.0	0.0	0.0	0.0	52.2						
34.0	Little Bald Mtn.	7-2	0.0	0.0	0.0	0.2	22.0						
35.0	Little Boulder Cr.	7-3	1.2	0.0	0.0	0.4	40.4						
36.0	W.Fork Potlatch R.	7-4	0.8	0.6	0.0	2.4	40.4						
37.0	Elk Creek Falls	7-5	0.2	0.4	0.0	4.8	15.8						
38.0	Morris Creek	7-6	0.0	0.0	0.0	0.2	26.5						
	Total Average of sites near Potlatch		0.4	0.2	0.0	1.3	37.8						
	*Site not trapped												